



Welcome

Ethical, Legal, and Social Implications (ELSI) of Gene-Environment Interaction Research

NIEHS and NHGRI Partnership

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The mission of the National Institute of Environmental Health Sciences is to discover how the environment affects people in order to promote healthier lives.



The vision of the National Institute of Environmental Health Sciences is to provide global leadership for innovative research that improves public health by preventing disease and disability.

What's in our environment that can impact our health?



What's in our environment that can impact our health?

Inter-individual genomic heterogeneity



What's in our environment that can impact our health?



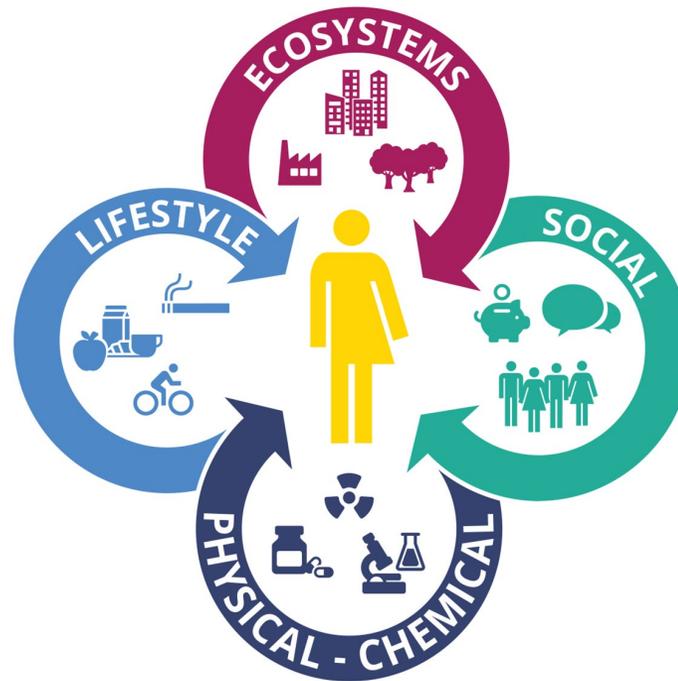
The Exposome

What is it?

Totality of exposures across life course, includes external and internal exposures

How to measure it?

Untargeted assessment via mass spectrometry, sensors, bioinformatics, and other tools



- Food outlets, alcohol outlets
- Built environment
- Urban land use
- Population density
- Green space



- Physical activity
- Sleep behavior
- Diet
- Smoking
- Drug / Alcohol use



- Household income
- Inequality
- Social capital
- Cultural norms
- Psychological / mental stress



- Temperature / Humidity
- Electromagnetic fields
- Ambient light
- Pollen / Mold / Fungus

- Point, line sources
- Odor / Noise
- Air pollution
- Agricultural activities

- Pesticides
- POPs
- Plastics / Plasticizers
- PBDEs

- Water contaminants
- Soil contaminants
- Food contaminants
- Occupational exposures



The challenges to defining the exposome

The Exposome

The totality of exposure an individual is subjected to from conception to death...the 'environmental' correlate to the genome.



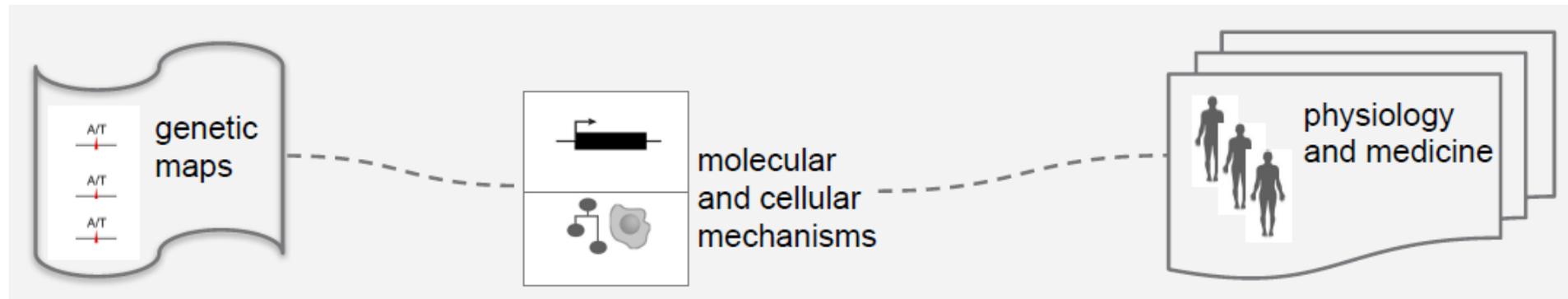
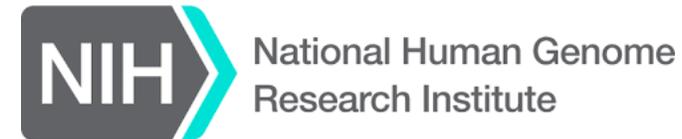
How do we define it?

How do we measure it?

How do we operationalize it?

Genetic and Epigenetic Contributions are Complex and Best Handled through Partnerships

- NHGRI has a strong focus on the genome science to tackle the challenges associated with the complex traits that underlie GXE
- ICDA: Working together to accelerate common complex disease discovery and translation



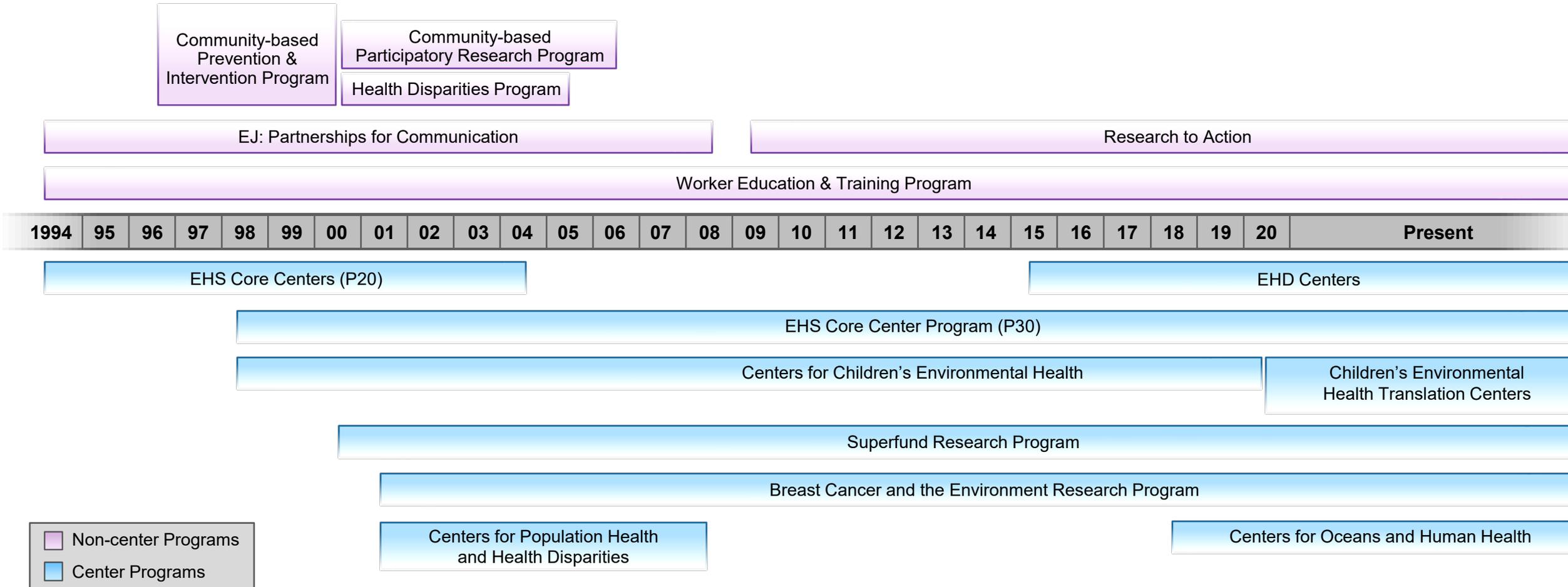
Integrating Multiscale Geospatial Environmental Data into Large Population Health Studies, June 15-16, 2021.



Addressing Racism As a Public Health Issue Through the Lens of Environmental Health Disparities and Environmental Justice, December 10, 2021.



NIEHS Programs Fostering Community-Engaged Research





ELSI Related to G X E Research

What does NIH need to consider?

What can we learn from what we have already done?



National Institute of Environmental Health Sciences
Your Environment. Your Health.

Thank you for Engaging with Us!



National Institute of
Environmental Health Sciences



National Toxicology Program
U.S. Department of Health and Human Services

